

Clinical practice guidelines for endoscopic breast surgery in patients with early-stage breast cancer: Chinese Society of Breast Surgery (CSBrS) practice guidelines 2021.

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There were 76 voting committee members for these guidelines: 63 from breast surgery departments (82.9%), four from medical oncology departments (5.3%), four from medical imaging departments (5.3%), two from a pathology department (2.6%), one from a radiotherapy department (1.3%), and two epidemiologists (2.6%).

Clinicians specializing in breast diseases in China.

Recommendation 1: Indications and contraindications for endoscopic breast surgery

In the guidelines, endoscopic breast surgery includes: endoscopic nipple-sparing mastectomy ± immediate breast implant reconstruction for breast cancer, and endoscopic axillary or internal mammary lymph node dissection/sentinel lymph node biopsy for breast cancer.

Indications Level of evidence Strength of recommendation 1.1.1 Imaging data indicate that the tumor has not invaded the nipple, areola, or subcutaneous tissue, and the distance from the margin of the tumor to the margin of the areola is ≥ 2 cm [2 – 4] II A 1.1.2 Clinical and imaging examinations of early-stage breast cancer reveal axillary lymph nodes $\leq cN1$ [5] I A 1.1.3 Internal mammary lymph node dissection/biopsy is necessary [6] II A

Contraindications Level of evidence Strength of recommendation 1.2.1 Severe mastoptosis [7] II A 1.2.2 Breast volume >500 mL [8] II A 1.2.3 History of axillary surgery [5] I A 1.2.4 Inflammatory breast cancer [9] II A

Methods Level of evidence Strength of recommendation 2.1.1 Establish the operating space by liposuction and maintain the space with CO₂ inflation or suspension [10] II A 2.1.2 Establish the operating space using a non-liposuction method and maintain the space with CO₂ inflation or suspension [11 , 12] II A 2.1.3 Operation under the guidance of entire-course monitoring [4] II A 2.1.4 Prevent hypercapnia through continuous positive-pressure ventilation [13] II A

Treatments Level of evidence Strength of recommendation 2.2.1 Convert to open surgery in cases of intra-operative hemorrhage of unknown cause [14 , 15] II A 2.2.2 Endoscopic exploration or open hemostatic surgery for post-operative active bleeding [16] II A

Reports state that endoscopic surgery can complete the same breast surgical operation through small and occult incisions, with the advantages of less bleeding, faster recovery, and better post-operative appearance. Endoscopic surgery is superior to conventional surgery regarding post-operative patients' physical and psychological rehabilitation. Currently, many hospitals in China have used endoscopic techniques for sentinel lymph node biopsy, axillary lymph node dissection, nipple-sparing total mastectomy, modified radical mastectomy, breast-conserving surgery, and partial mammaplasty and breast reconstruction for breast cancer. The application of endoscopic techniques in the treatment of breast cancer has received extensive attention and active exploration in clinical practice. However, there is still a lack of high-level evidence. Based on a literature review, the panel experts re-evaluated the quality of clinical research evidence concerning endoscopic surgical techniques for breast cancer in accordance with the GRADE method, and compiled the guidelines with the goal of accessibility in the clinical practice of breast surgery in China, to provide a reference for the clinical work of Chinese breast surgeons. After in-depth discussions, the panel experts reached the consensus that endoscopic techniques have been widely used in clinical surgery and provide clinical benefits, and for their use in breast surgery in China, multi-center studies should be conducted as soon as possible to provide high-level evidence.

Previous studies have shown that the safety of endoscopic axillary lymph node dissection is not inferior to that of open surgery. [17] Along with the introduction of high-definition endoscopic equipment, the anatomical structure of the axilla under endoscopy is clearer, which can minimize injury to the axillary nerves, blood vessels, and lymphatic vessels; thus, effectively improving

patients' quality of life. [18]

Among patients with breast cancer, increasing attention has been paid to the diagnosis and treatment of internal mammary lymph node metastases. For patients with indications, internal mammary lymph node dissection using endoscopic techniques has been successful in China. Endoscopic internal mammary lymph node biopsy or dissection via the thoracic approach provides a better operating space and visual field; thus, avoiding injury caused by removing the costal cartilage. [19]

Breast-conserving surgery has not been widely applied in China. Increasing the proportion of breast-conserving surgery in Chinese patients with early-stage breast cancer should be a priority for breast surgeons. Recently, precise local extended resection has been achieved by endoscopic surgery under the guidance of intra-operative ultrasonographic positioning + the vacuum-assisted Mammotome system or margin-labeling with dye in early-stage breast cancer, which achieves the key technical points of breast-conserving surgery. Compared with conventional open surgery, endoscopic surgery provides the optimal breast-conserving effect, [20] indicating a new direction in breast-conserving surgery.

Endoscopic surgery also provides advantages in breast reconstruction. In particular, breast reconstruction with prosthesis implantation is used mainly after total mastectomy. The incidence of perioperative complications is relatively low in patients receiving endoscopic subcutaneous gland resection + immediate breast reconstruction with prosthesis implantation. [7 , 21] With endoscopic assistance, the latissimus dorsi musculocutaneous flap can be harvested with adequate tissue, comparable to conventional surgery, which avoids large surgical scars on the back and providing superior cosmetics and minimally invasive effects compared with conventional surgery. [22] Subcutaneous gland resection and latissimus dorsi musculocutaneous flap transfer for breast reconstruction can be completed endoscopically, and provides better cosmetic effect and a minimally invasive approach and reduces the risk of complications, such as post-operative bleeding, edema, ecchymosis, seroma, and infection. [23] The safety of endoscopic breast reconstruction with a pedicled greater omentum has also been investigated. [24]

The current status of endoscopic breast surgery in medical institutions in China and abroad is uneven. To standardize the clinical applications of endoscopic surgery for breast cancer in China, the CSBrS published the "Consensus Statements and Operation Guidelines on Endoscopic Surgery for Breast Cancer" in 2019. [4] According to the consensus, breast surgeons who perform endoscopic surgery should receive standardized training; master the basic principles and practice these, stepwise; and avoid additional trauma to patients owing to blind pursuit of surgical effects. High-level evidence pertaining to endoscopic surgery for breast cancer treatment is still lacking. Despite the extensive application of endoscopic breast surgery worldwide, treatment standardization and application promotion remain difficult.

Basic operation for endoscopic surgery for breast cancer ().

The expert committee for these guidelines declares no conflicts of interest. These guidelines are a reference for breast disease specialists in clinical practice. However, the guidelines are not to be used as the basis for medical evaluation, and do not play an arbitrating role in the handling of any medical disputes. The guidelines are not a reference for patients or non-breast specialists. The Chinese Society of Breast Surgery assumes no responsibility for results involving the inappropriate application of these guidelines, and reserves the right to interpret and revise the guidelines.

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